Design Thinking and Advanced Prototyping

ELEC-C9821 – AI in Concept Design

Aalto University
School of Electrical
Engineering

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22.3.2023

Today’s agenda

09:15 - 10 Lecture

1. AI in concept design
2. Prompt engineering for concept image generation

10:15 - 12 Workshop

3. Project work

Microsoft’s OneDrive deleted the next 60 slides

Prompt engineering

You can ask the AI to generate text in a particular way.

I have tried it to:

1. **Update learning goals and activities to respond to the challenges and opportunities of AI in education**
2. **Creating a portrait of a mannequin for the new electronics lab**
3. **Trying out design concept imagery**

Experiment with GPT4 and MidJourney

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Without prompt engineering:

A modular, wall-mounted smart indoor garden system with an integrated mobile app for plant monitoring and maintenance.

Without prompt engineering:

A modular, wall-mounted smart indoor garden system with an integrated mobile app for plant monitoring and maintenance.

Without prompt engineering:

A modular, wall-mounted smart indoor garden system with an integrated mobile app for plant monitoring and maintenance with people using the app.

Without prompt engineering:

A modular, wall-mounted smart indoor garden system with an integrated mobile app for plant monitoring and maintenance with people using the app.

With prompt engineering:

(after giving the instructions to GPT4)

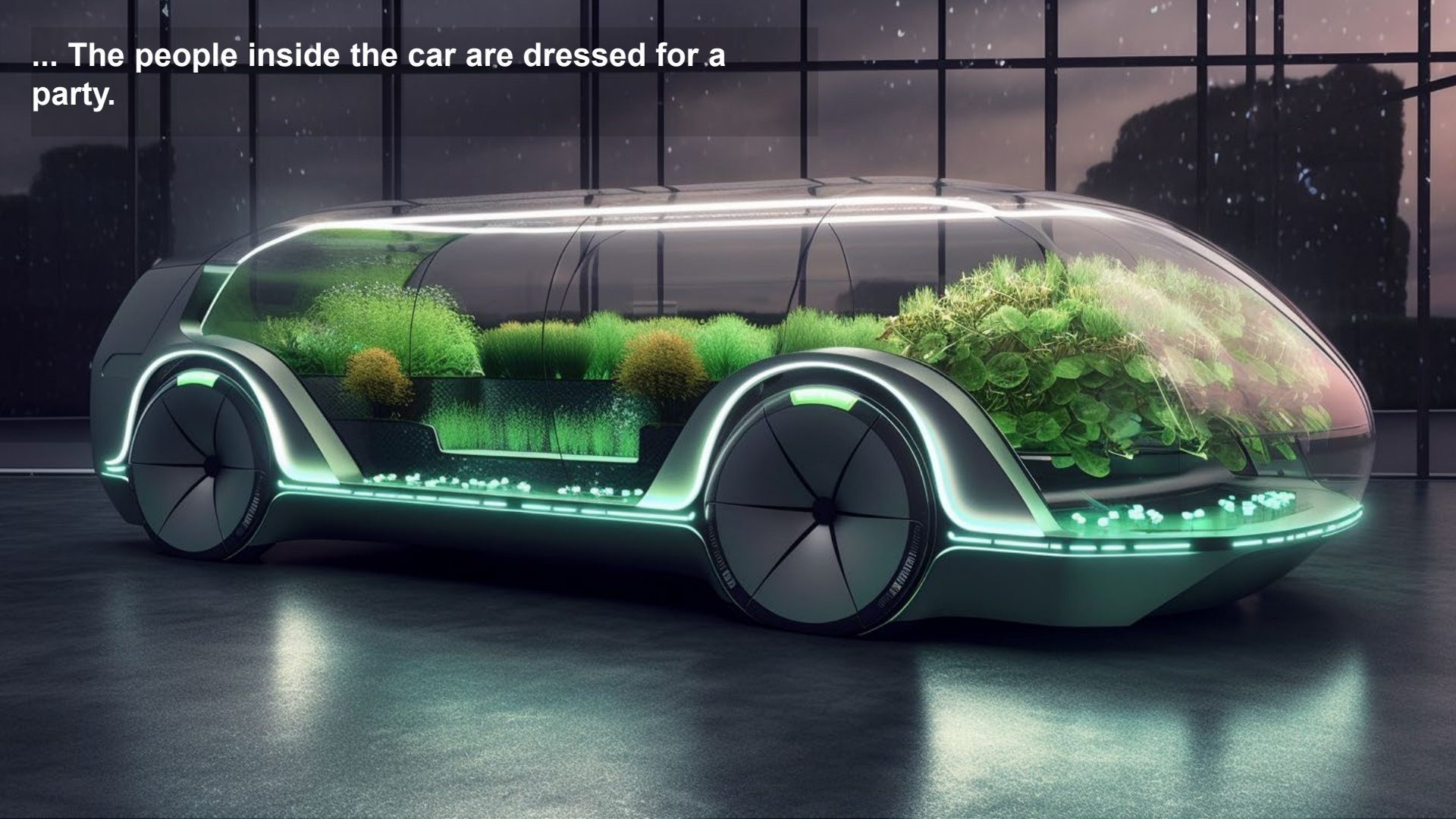
Salu: You will be now the creator of a prompt for Midjourney. Use what you learned from the above prompt examples, and generate a prompt for a modular, wall-mounted smart indoor garden system with an integrated mobile app for plant monitoring and maintenance.

GPT4: An impressive, high-resolution image of a modular, wall-mounted smart indoor garden system, showcasing a seamless fusion of advanced technology and indoor gardening. The system features a sleek, modern design with customizable, interchangeable plant modules that allow for effortless personalization and expansion. Integrated with a user-friendly mobile app, the smart garden system enables real-time monitoring and maintenance of plant health, watering schedules, and lighting conditions, ensuring optimal growth and flourishing greenery. The photograph is captured with a Nikon Z7 II camera and a 24-70mm f/2.8 lens, using settings at f/5.6, ISO 200, and a shutter speed of 1/125. The composition emphasizes the brilliant combination of technology, sustainability, and interior design, presenting a visually stunning image that embodies the future of urban living and promotes a greener, more connected home environment. --ar 16:9 --q 1.5 --v 5

Another experiment:
A vegetable growing concept car

You will be now the creator of a prompt for Midjourney. Use what you learned from the above prompt examples, and generate a prompt for a new electronic car that can be used to grow vegetables.

... The people inside the car are dressed for a party.




... an electronic car concept in New York city with passengers on board. The car can be used for growing vegetables.

Another experiment: Remote control

.. a new minimalist remote control that uses Cloud technology to control an unlimited amount of screens.


.. a new minimalist remote control that has only two buttons. I controls an unlimited amount of screens, which as shown on the background, blurred.

.. a new minimalist device that has only two sleek buttons on its top. The device is used to manipulate an unlimited amount of screens, which as shown on the background, blurred.


.. a photo of a viking who is looking furious, hands are spread towards horizon that is populated with a mountain of digital monitors..


.. a photo of a viking who is looking furious, facing the camera, hands are spread towards horizon, holds a remote control, a pile of digital monitors is blurred

Take back control

Cloud-based remote control for all your dynamic decks

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The prompt engineering for GPT4 to instruct Midjourney

Salu: We are creating images with a Diffusion model. I will input some information about it, okay?

Of course! Feel free to provide any information you have about your Diffusion model, and I will try to help you with any questions or guidance you may need.

The prompt engineering for GPT4 to instruct Midjourney

Salu: The model is for Midjourney, which is another AI-powered tool that generates images from user prompts. It is proficient at adapting actual art styles to create an image of any combination of things I will prompt for it. It excels at creating environments, especially fantasy and sci-fi scenes with dramatic lighting that looks like rendered concept art.

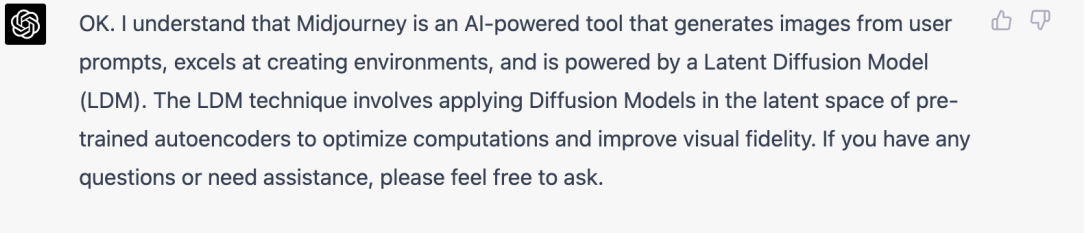
The prompt engineering for GPT4 to instruct Midjourney

Salu: Midjourney is powered by Latent Diffusion Model (LDM), which is a text-to-image synthesis technique. Diffusion Models (DM) are generative models that take input data, then add noise until it is not recognisable, and then learn to generate the same image from the noise.

The prompt engineering for GPT4 to instruct Midjourney

Salu: To optimize the computations, DMs are applied in the latent space of powerful pre-trained autoencoders. Training a diffusion model on such a representation make it possible to achieve an optimal point between complexity reduction and detail preservation, significantly improving visual fidelity.

If you understand, just respond OK?



-- Presence Check --

Project work

Prototype V2
Learning Goals and Requirements

Due this Friday!

Circuit Shop Schedule

We have a scheduler on MyCourses to help you to distribute across the week so that the small space does not get too full.

Circuit Shop (piiripaja) is located in front of the Electronics Workshop (Sähköpaja).

Available times are during the regular exercise times (may be adjusted if needed)

This week

- **Project: Build your Proto V2**
- **Keep writing your diary**
- **Exercises (mini project) (Fri 14-16, Mon 14-16, Tue 10-12)**
  - VOLUNTARY!